

**REVISIONS**

SYMBOL	DESCRIPTION	DATE	APPROVAL
—	Initial Release	7/31/12	JS

**SHEET REVISION STATUS**

SH	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
REV	--	--	--	--	--	--	--	--	--	--	--	--	--	--						
SH	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
REV																				

<b>ORIGINATOR:</b> T.J. Perry/MEI Technologies <i>T.J. Perry</i>	<b>DATE</b> 7/30/12	<b>FSC: 5930</b>
<b>APPROVED:</b> T.J. Perry/MEI Technologies <i>T.J. Perry</i>	7/30/12	Switch, Thermostatic, (Bimetallic), Subminiature Sealed, Single Pole, Single Throw (SPST), 5 Amperes and Low Level, Detail Specification for
<b>CODE 562 APPROVAL:</b> B. Meinhold/GSFC <i>B. Meinhold</i>	7/30/2012	
<b>CODE 562 SUPERVISORY APPROVAL:</b> K. Sahu/GSFC <i>K. Sahu</i>	7-30-2012	
<b>ADDITIONAL APPROVAL:</b>		S-311-641/05

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
 GODDARD SPACE FLIGHT CENTER  
 GREENBELT, MARYLAND 20771

CAGE CODE: 25306

## GSFC DETAIL SPECIFICATION

SWITCHES, THERMOSTATIC, (BIMETALLIC), SUBMINIATURE, HERMETICALLY SEALED, SINGLE POLE, SINGLE THROW (SPST), 5 AMPERES AND LOW LEVEL

The requirements for procuring the thermostatic switches described herein shall consist of this specification, the current revision of GSFC S-311-641 and QPL-24236..

PART NUMBER:

G311P641/05 A -30 B 099 -10 -05 -20 (S)

(A) (B) (C) (D) (E) (F) (G) (H) (I)

(A) GSFC Prefix

(B) Configuration (See Figure 1)

(C) Low Temperature

The low temperature operating point (°F) shall be designated by 3 digits. For negative temperatures, the first digit shall be a minus (-).

(D) Contact Action

A Open on rise, silver contacts

B Close on rise, silver contacts

C Open on rise, gold contacts (low level)

D Close on rise, gold contacts (low level)

(E) High Temperature

The high temperature operating point (°F) shall be designated by 3 digits. For negative temperatures, the first digit shall be a minus (-).

(F) Open Temperature Tolerance

Use Table 1 for standard tolerance, Table 2 for special tolerance

(G) Close Temperature Tolerance

Use Table 1 for standard tolerance, Table 2 for special tolerance

(H) Differential

Use Table 1 for standard differential, Table 2 for special differential

(I) Special

Special lead attach. Consult factory for available wire types, sizes, and lengths. Omit if leads not required.

## REQUIREMENTS:

Dimensions and configuration: See Figure 1

Storage temperature range: -80°F to 550°F (-62.2°C to +287.8°C)

Operating temperature range: -65°F to 550°F (-53.9°C to +287.8°C)

Tolerances: See Tables 1 and 2

Contact ratings: See Table 3

Contact resistance: 0.050 ohms maximum per MIL-STD-202, Method 307

Dielectric Withstanding Voltage: 1250 VAC, rms, 60 Hz for 1 minute, terminal to case, per MIL-STD-202, Method 301

Vibration: 5-2000 Hz, 20 G, per MIL-STD-202, Method 204, Condition D (monitored)  
5-1000 Hz, 100G, per MIL-STD-202, Method 204, Condition D (unmonitored)  
1000-2000, 50G, per MIL-STD-202, Method 204, Condition D (unmonitored)

Shock: 100G, 6 milliseconds, per MIL-STD-202, Method 213

Hermeticity:  $1 \times 10^{-8}$  atm cc/sec maximum, per MIL-STD-202, Method 112, Condition C

Salt spray resistance: Per MIL-STD-202, Method 101, Condition B, 5% solution

Moisture resistance: Per MIL-STD-202, Method 106

Weight (avg): 4.8 grams basic unit; 5.9 grams with bracket

Finish: 0.0003 - 0.0004 inches Ni per AMS-QQN-290 over 0.0002 - 0.0003 inches Cu per MIL-C-14550

Wire leads: Standard 18AWG, stranded wire leads are available in white or black Teflon® insulation, in accordance with SAE AS22759/11. Other wires are available upon request.

Qualification: Qualification listing to MIL-PRF-24236/1 is required for each configuration.

Screening: Switches shall be subjected to 100% Group A screening inspection per S-311-641, Table I, Test Nos. 1-12, with the following details and exceptions:

- a. PIND per manufacturer's GSFC approved internal test procedures.
- b. Creepage testing shall be performed in accordance with MIL-PRF-24236, para. 4.6.4 for three (3) consecutive cycles.
- c. Switches shall be heated or cooled as required to cause thermal actuation. The rate of temperature change of the switch shall be the minimum practical to provide reliable creepage detection.
- d. Tested units shall meet the requirements in MIL-PRF-24236, para. 3.9, except contact transfer time shall not exceed five (5) milliseconds.

Table 1 Standard Tolerances

Operating Temperature Range (°F)	Nominal Differential (°F)	Open Temperature Tolerance (+/- °F)	Close Temperature Tolerance (+/- °F)
-65 to -1	30	10	8
0 to 200	20	5	5
201 to 300	30	8	6
301 to 450	40	12	12
451 to 550	70	25	25

Table 2 Special Tolerances

Operating Temperature Range (°F)	Available Differential Range (°F)			Open Temperature Tolerance (+/- °F)	Close Temperature Tolerance (+/- °F)
	Minimum Differential (°F)	Nominal Differential (°F)	Maximum Differential (°F)		
-65 to -1	25	30	80	8	6
0 to 200	9	20	80	3	3
201 to 300	20	30	80	7	5
301 to 450	30	40	80	10	10
451 to 550	60	70	80	22	22

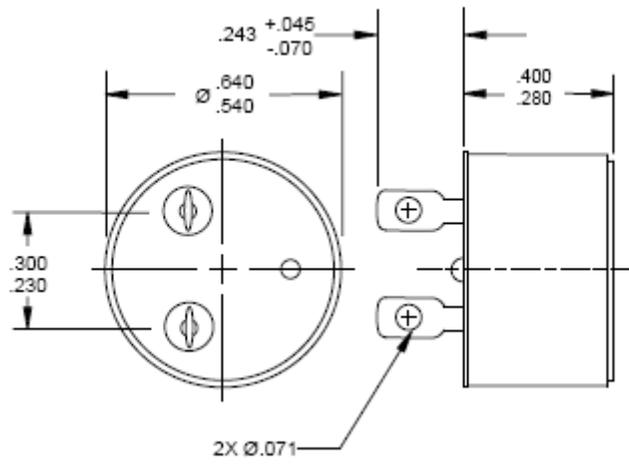
Operating temperature: Temperature at which contacts close.

Differential: Subtract (for close on rise) or add (for open on rise) the differential from the closing temperature to determine the temperature at which the contacts will open.

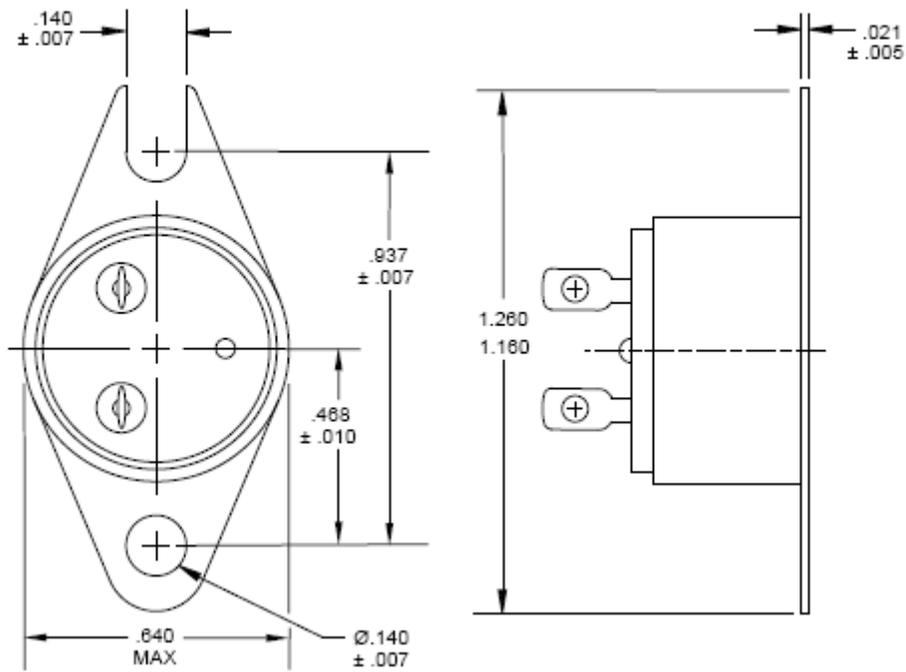
Table 3 Contact Ratings (Resistive)

Contacts	30VAC/DC	125 VAC	250 VAC	Life Cycles
Fine Silver	Amperes			
	5.0	2.0	1.0	100,000
	5.5	3.0	1.5	50,000
	6.0	4.0	2.0	25,000
	6.5	5.0	2.5	10,000
	7.0	6.0	3.0	5,000
Gold Plated Fine Silver	12 Vdc, 500 mA, rated to low levels as low as 30 mVdc, 10 mA	200mA	100mA	100,000

Note: Contact ratings are based on standard differential.

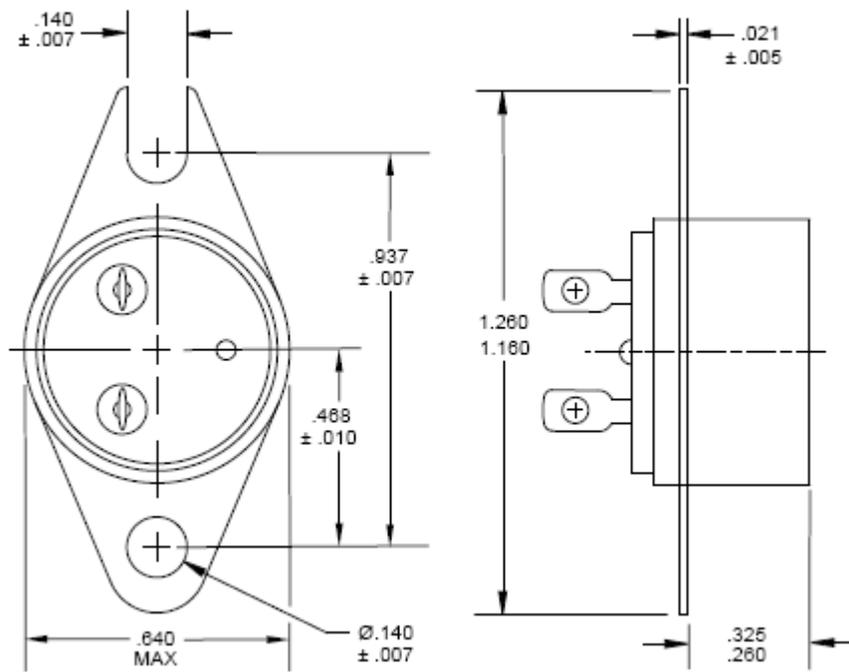


Configuration A

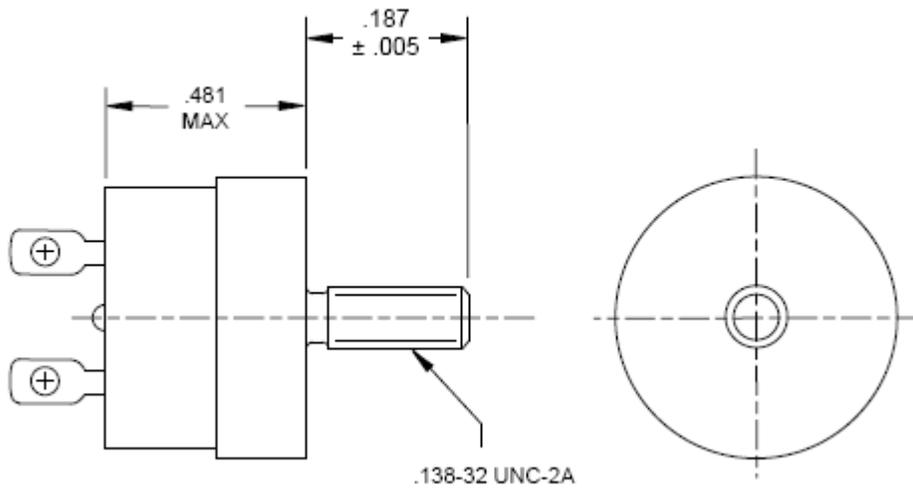


Configuration B

Figure 1. Dimensions.

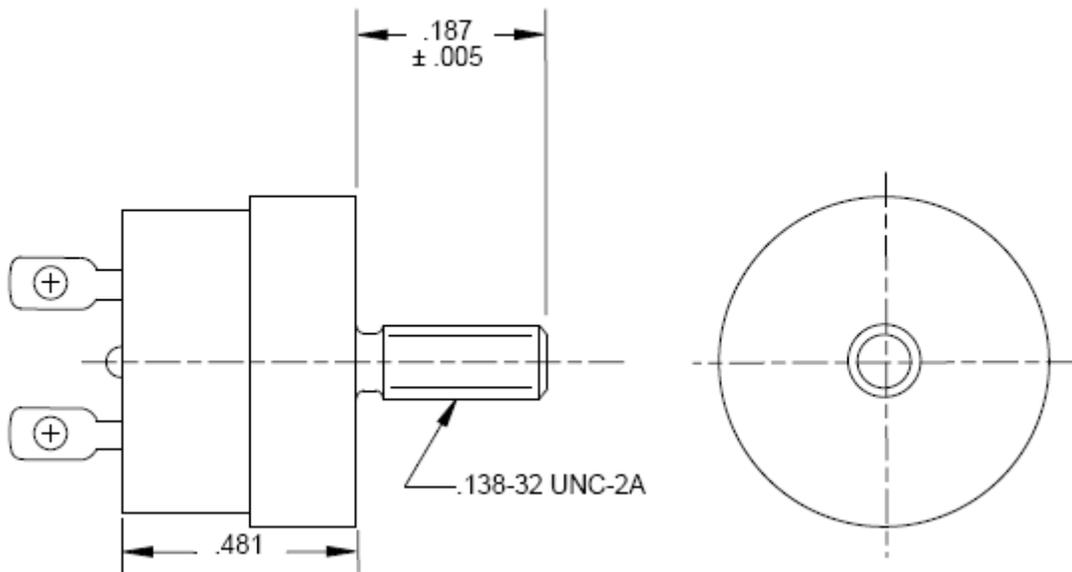


Configuration C

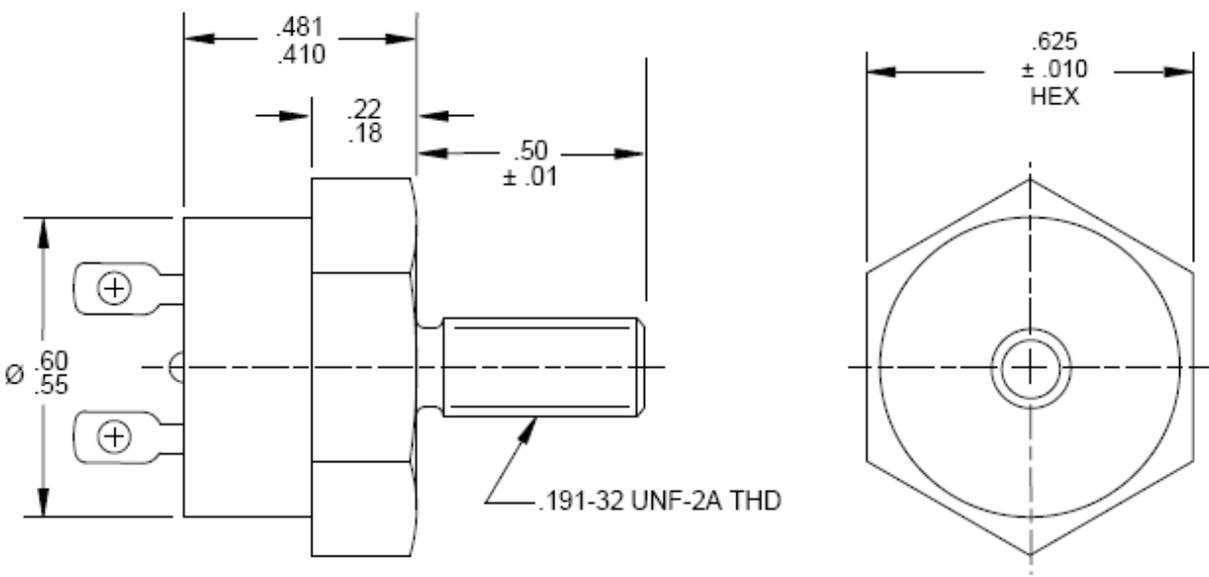


Configuration D

Figure 1. Dimensions (continued).

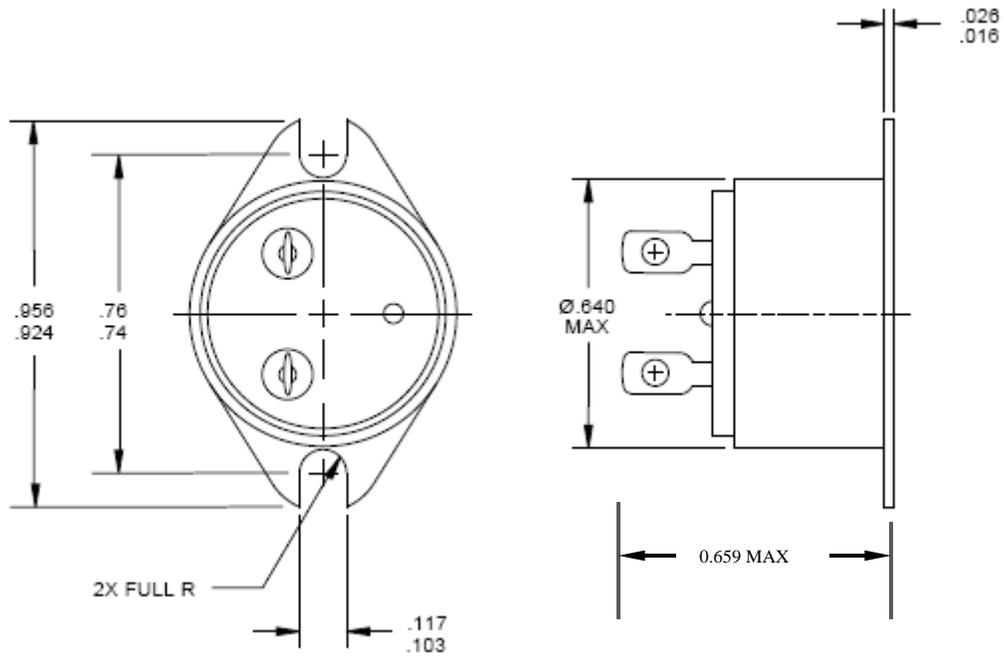


Configuration E

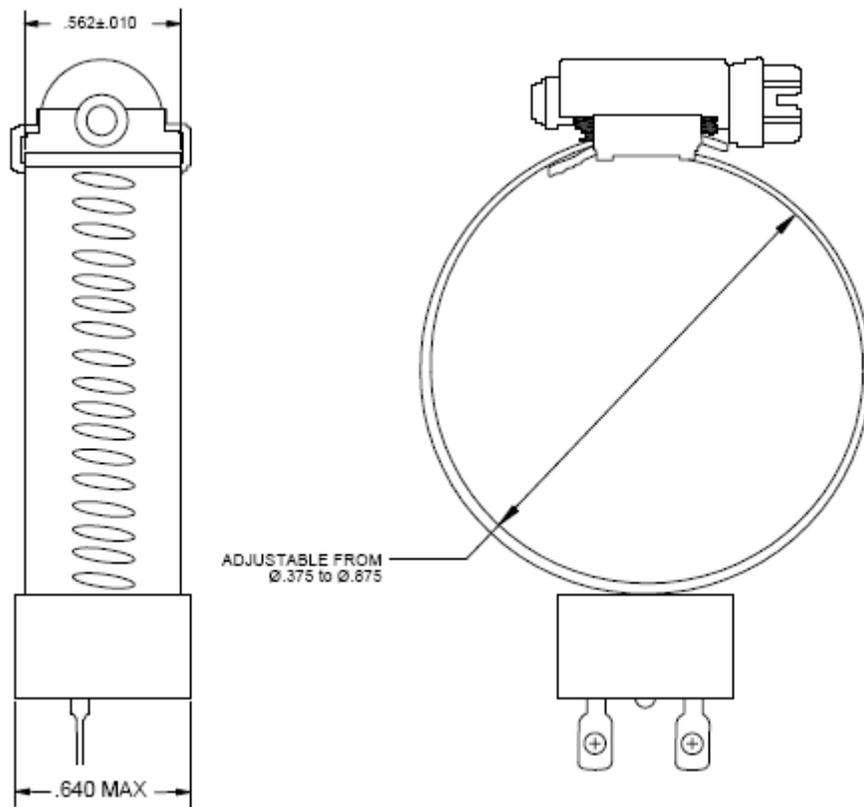


Configuration F

Figure 1. Dimensions (continued).

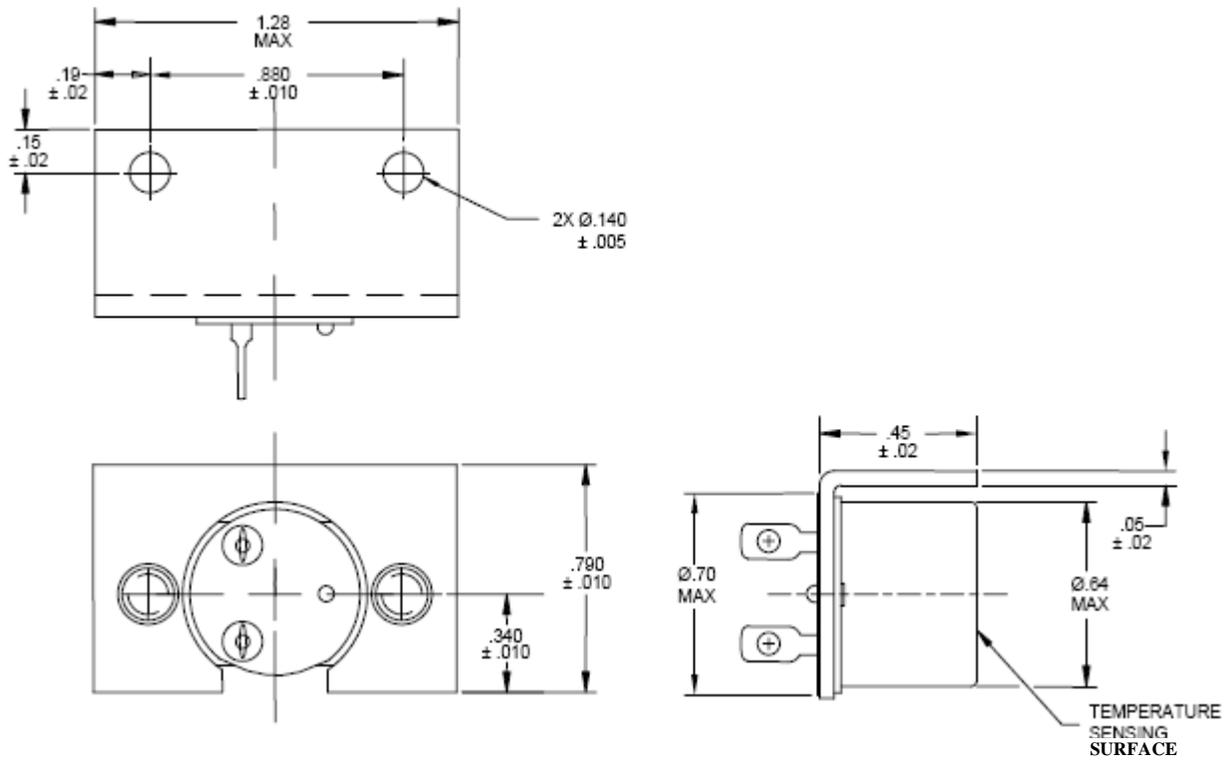


Configuration G

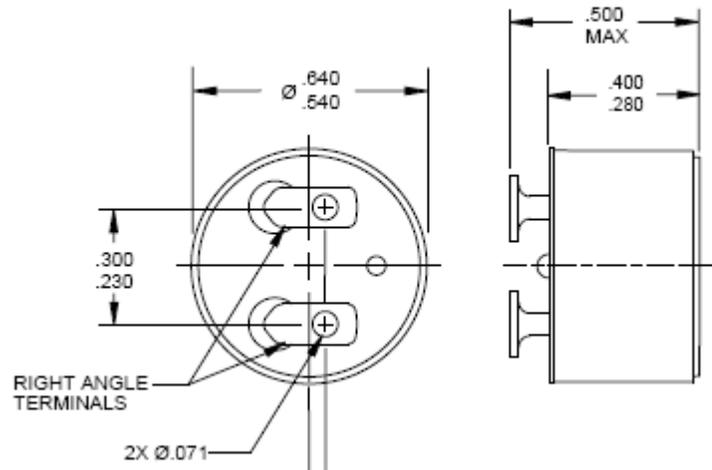


Configuration H

Figure 1. Dimensions (continued).

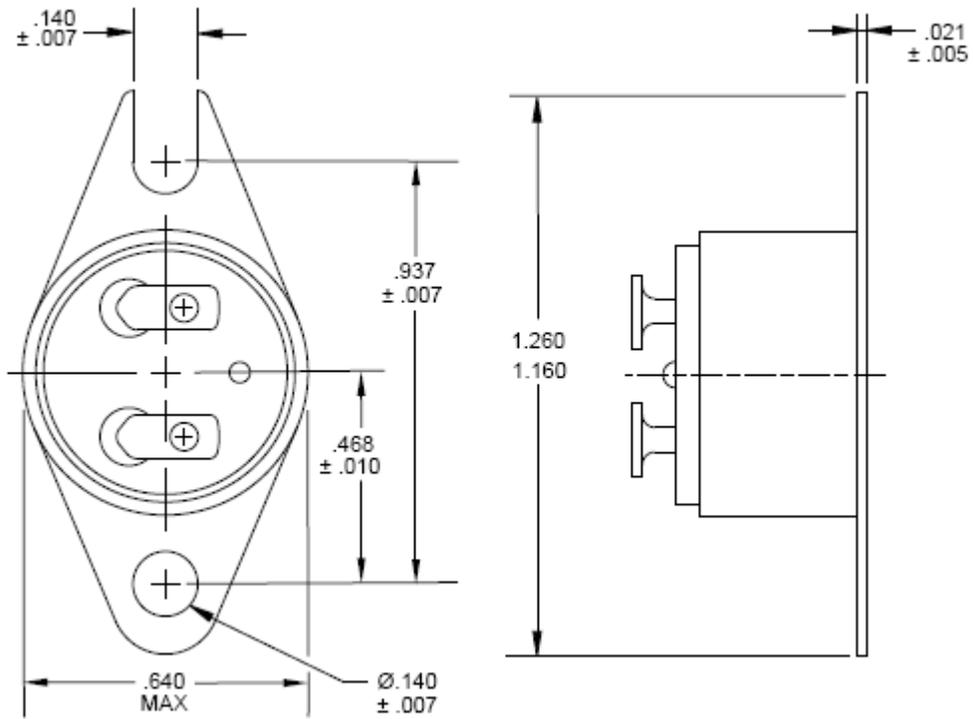


Configuration J

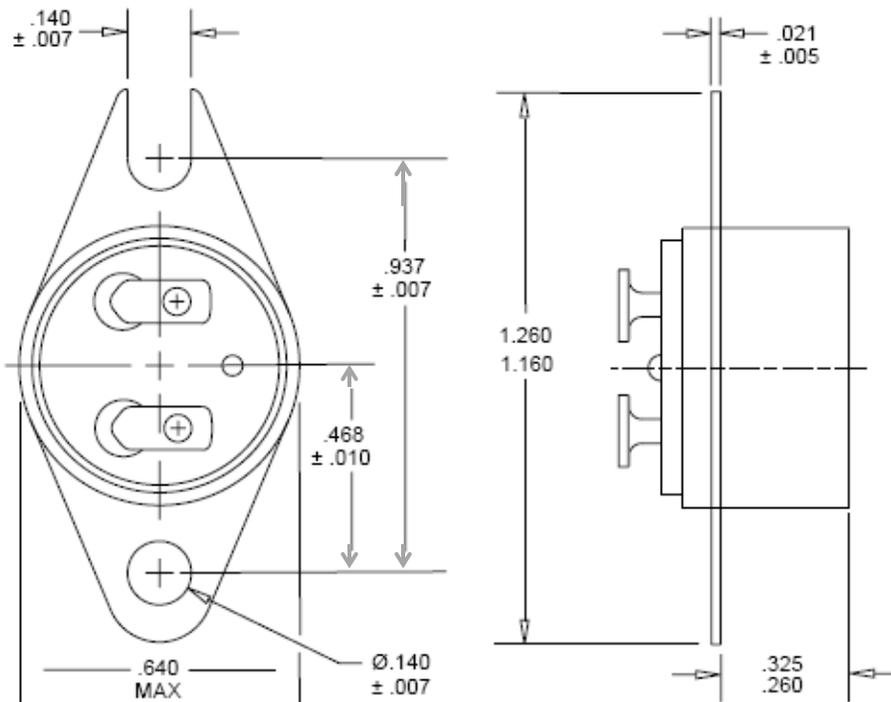


Configuration K

Figure 1. Dimensions (continued).



Configuration L



Configuration M

Figure 1. Dimensions (continued).

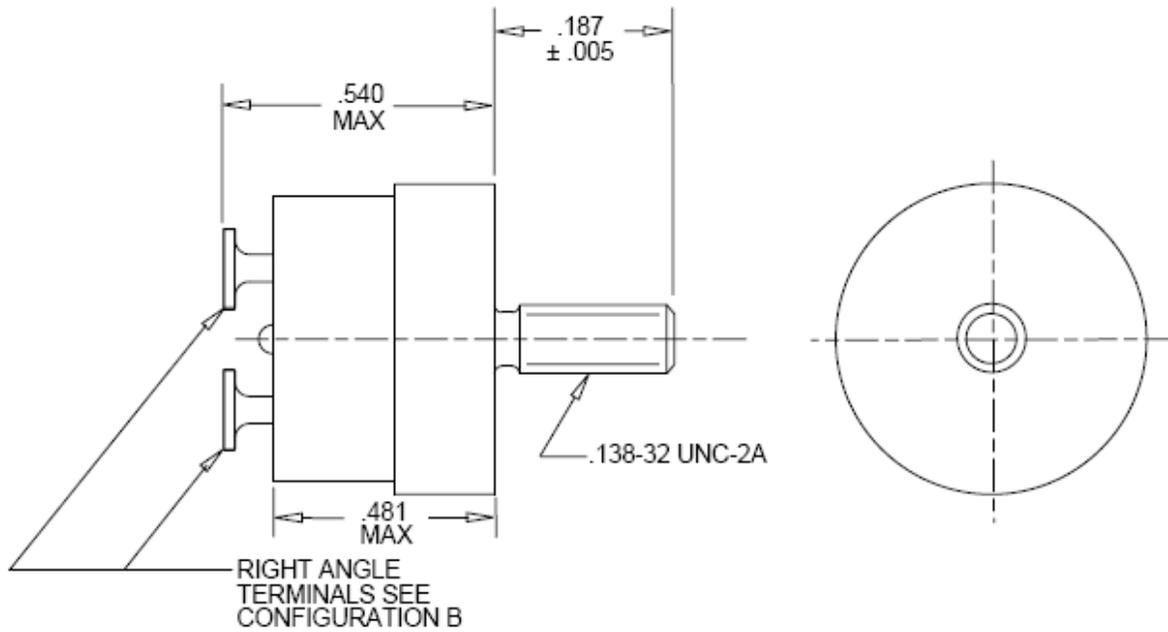
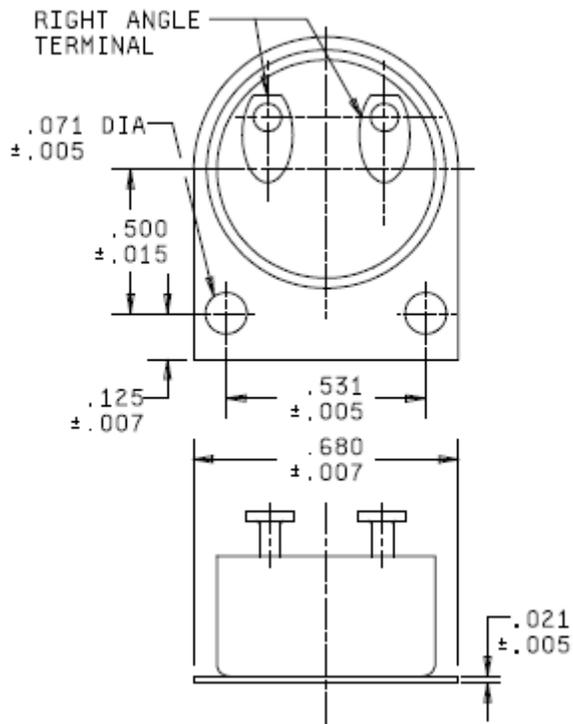
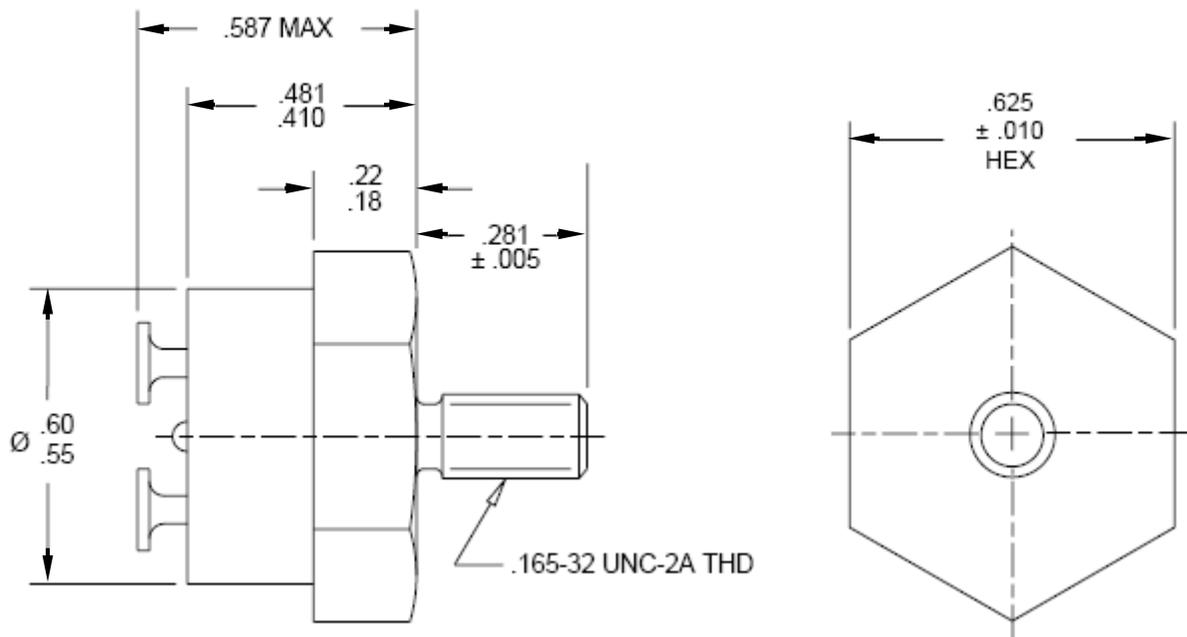
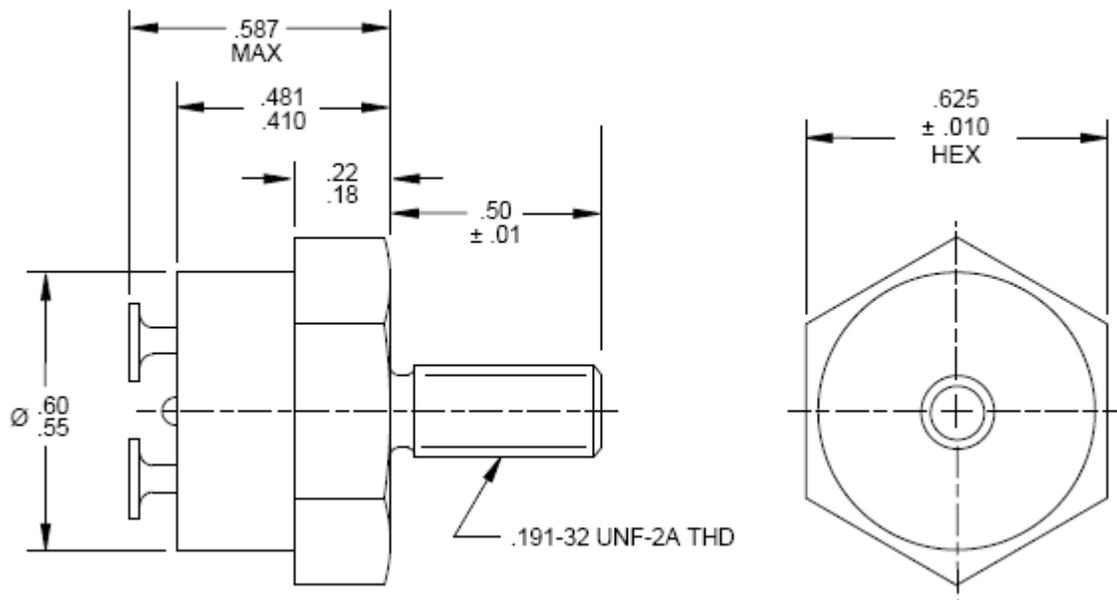


Figure 1. Dimensions (continued).

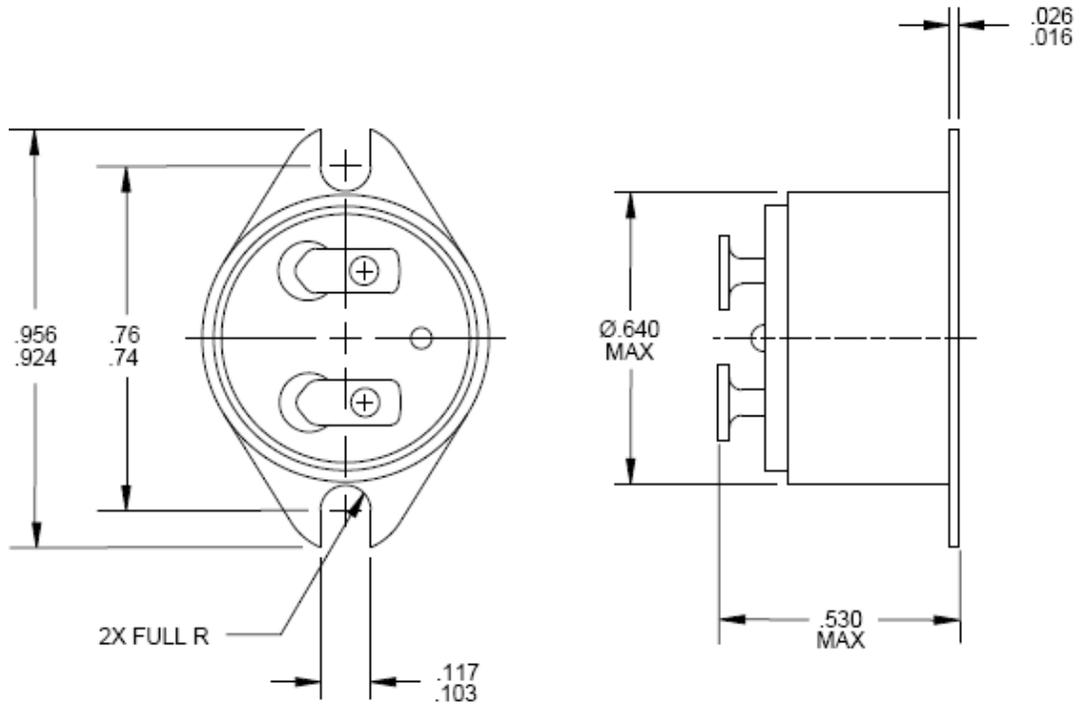


Configuration Q

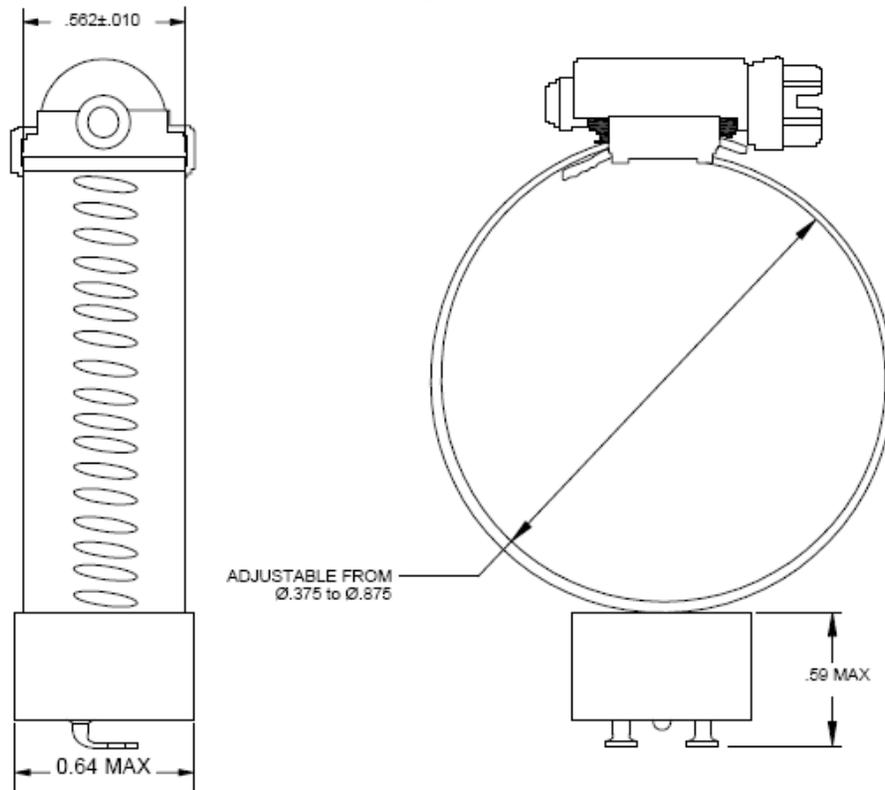


Configuration R

Figure 1. Dimensions (continued).

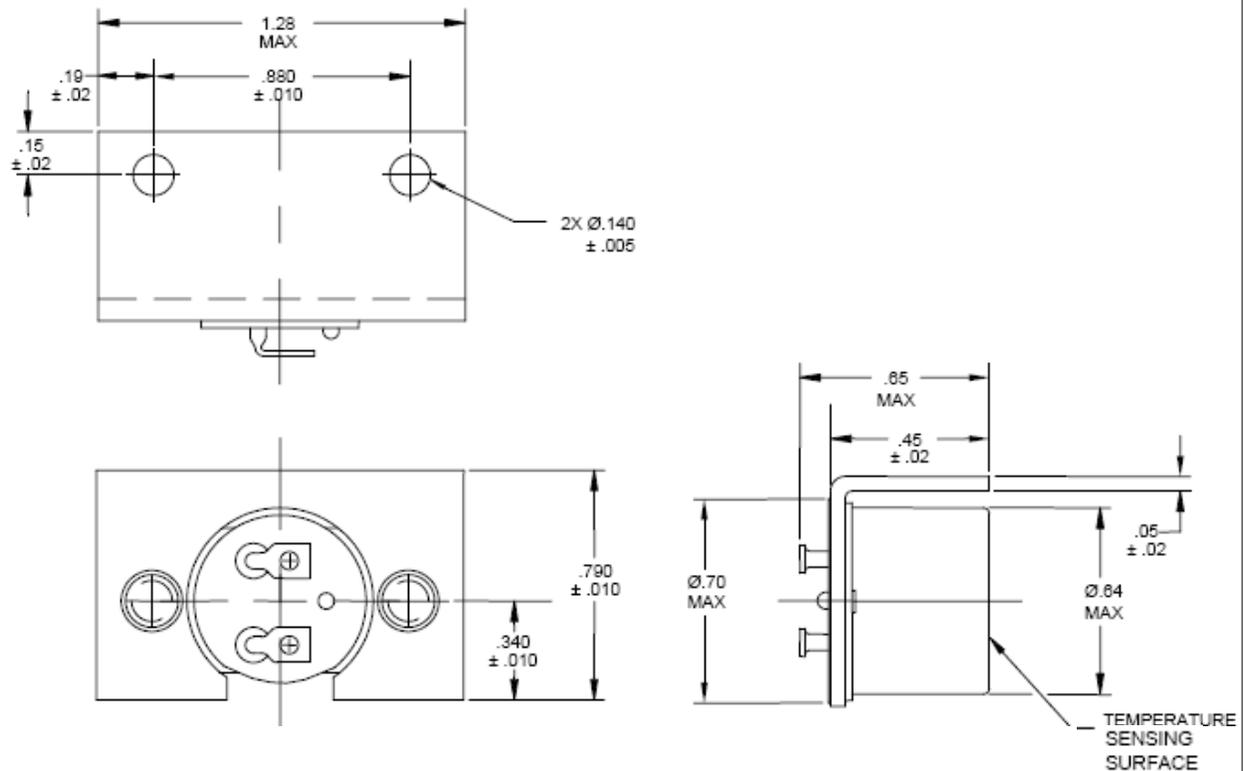


Configuration S



Configuration T

Figure 1. Dimensions (continued).



Configuration U

NOTES:

1. Dimensions are in inches.
2. Unless otherwise specified, tolerance is  $\pm .015$ .
3. Exact shape of switch and terminals are optional provided dimensions specified are not exceeded.
4. Configuration B, C, D, E, F, F, H and J use the basic switches of configuration A.  
Configuration L, M, N, P, Q, R, S, T and U use the basic switches of configuration K.

Approved source(s):

Manufacturer	Cage Code	Vendor Similar Part Number
Sensata Technologies	82647	M1/11041

Custodian: QPLD Administrator  
Parts, Packaging & Assembly Technologies Office, Code 562  
Goddard Space Flight Center  
Greenbelt, MD 20771